AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Please cancel claims 1-29.

Claim 30. (New) An integrated lab-on-a-chip diagnostic system for carrying out a sample preparation process on a fluid sample containing cells and/or particles, the system comprising:

(a) an inlet for a fluid sample;

(b) a lysis unit for lysis of cells and/or particles contained in the fluid sample;

(c) a nucleic acid extraction unit for extraction of nucleic acids from the cells and/or particles contained in the fluid sample;

(d) a reservoir containing a lysis fluid in fluid communication with the inlet, an optional valve being present to control the flow of fluid therebetween;

(e) a reservoir containing an eluent for removing nucleic acids collected in the nucleic acid extraction unit, said reservoir being in fluid communication with the inlet, and there is optionally a valve to control the flow of fluid therebetween;

wherein the sample inlet is in fluid communication with the lysis unit, and there is optionally a valve to control the flow of fluid therebetween;

wherein the lysis unit is in fluid communication with the nucleic acid extraction unit, and there is optionally a valve to control the flow of fluid therebetween;

wherein the reservoir containing the lysis fluid is in fluid communication with the lysis unit, and there is optionally a valve to control the flow of fluid therebetween; and

wherein the reservoir containing the eluent is in fluid communication with the nucleic acid extraction unit, and there is optionally a valve to control the flow of fluid therebetween, and wherein said system further comprises a pump or syringe for introducing a fluid sample and/or air into the inlet, whereby the system is driven by a single pumping system.

Claim 31. (New) A system as claimed in claim 30, further comprising (g) a nucleic acid reaction unit, wherein the nucleic acid extraction unit is in fluid communication with the nucleic acid reaction unit, and there is optionally a valve to control the flow of fluid therebetween.

Claim 32. (New) A system as claimed in claim 30, further comprising (h) a waste unit, wherein the waste unit is in fluid communication with the lysis unit, and there is optionally a valve to control the flow of fluid therebetween.

Claim 33. (New) A system as claimed claim 30, further comprising (i) a reservoir containing a washing solvent, which reservoir is in fluid communication with the nucleic acid extraction unit, and there is optionally a valve to control the flow of fluid therebetween.

Claim 34. (New) A system as claimed in claim 33, further comprising (j) a reservoir containing a further washing solvent, which reservoir is in fluid communication with the nucleic acid

extraction unit, and there is optionally a valve to control the flow of fluid therebetween.

Claim 35. (New) A system as claimed in claim 34, wherein the reservoir containing the eluent is in fluid communication with the reservoir containing the first washing solvent and/or the reservoir containing the second washing solvent.

Claim 36. (New) A system as claimed in claim 35, wherein the eluent, the first washing solvent and/or the second washing solvent are contained in a common reservoir.

Claim 37. (New) A system as claimed in claim 36, wherein the eluent, the first washing solvent and/or the second washing solvent are separated from one another in the common reservoir by a fluid.

Claim 38. (New) A system as claimed in claim 36, wherein the common reservoir comprises a conduit in fluid communication with the inlet and the lysis unit.

Claim 39. (New) A system as claimed in claim 30, further comprising a filtration unit, which unit is in fluid communication with the lysis unit.

Claim 40. (New) A system as claimed in claim 39, wherein the filtration unit comprises one or more of a dead-end filter, a cross-flow filter, a gravity settler, a centrifuge, an acoustic cell filter, an optical trap, dielectrophoresis (DEP), electrophoresis, flow cytometry and adsorption based methods.

Claim 41. (New) A system as claimed in claim 30, wherein the lysis unit further comprises a filter to filter the fluid sample.

Claim 42. (New) A system as claimed in claim 41, wherein said filter comprises one or more of a dead-end filter, a cross-flow filter, a gravity settler, a centrifuge, an acoustic cell filter, an optical trap, dielectrophoresis (DEP), electrophoresis, flow cytometry and adsorption based methods.

Claim 43. (New) A system as claimed in claim 30, wherein the system further comprises a heater for heating the contents of the lysis unit and/or the nucleic acid extraction unit.

Claim 44. (New) A system as claimed in claim 43, wherein said heater comprises one or more Peltier elements located in or adjacent the lysis unit and/or the nucleic acid extraction unit.

Claim 45. (New) A system as claimed in claim 30, wherein the nucleic acid extraction unit is at least partially filled with silica beads or particles.

Claim 46. (New) A system as claimed in claim 45, wherein the nucleic acid extraction unit further comprises one or more sets of electrodes adjacent the silica beads or particles for collecting and/or preconcentrating the eluted nucleic acids.

Claim 47. (New) A system as claimed in claim 46, wherein said one or more sets of electrodes comprises platinum electrodes.

Claim 48. (New) A system as claimed in claim 30, for extracting nucleic acids present in a biological fluid, a dairy product, an environmental fluid, or drinking water.

Claim 49. (New) An apparatus for the analysis of biological and/or environmental samples, the apparatus comprising a system as defined in claim 30.

Claim 50. (New) An assay kit for the analysis of biological and/or environmental samples, the kit comprising a system as defined in claim 30 and means for contacting the sample with the system.

Claim 51. (New) An apparatus as claimed in claim 30 which is disposable.

Claim 52. (New) A method for the manufacture of an integrated lab-on-a-chip diagnostic system as defined in claim 30, which method comprises:

A. providing a substrate having an inlet recess, a lysis unit recess, a nucleic acid extraction unit recess, a lysis fluid reservoir recess and an eluent reservoir recess in a surface thereof;

B. providing a cover; and

C. bonding the cover to the substrate to create the (a) inlet, (b) the lysis unit, (c) the nucleic acid extraction unit,

(d) the lysis fluid reservoir and (e) the eluent reservoir, each being defined by the respective recess in said surface of the substrate and the adjacent surface of the cover.

Claim 53. (New) A method as claimed in claim 52, further comprising the step of introducing lysis fluid into the lysis fluid reservoir either before or after bonding the cover to the substrate.

Claim 54. (New) A method as claimed in claim 52, further comprising the step of introducing eluent into the eluent reservoir either before or after bonding the cover to the substrate.

Claim 55. (New) A method as claimed in claim 52, further comprising the step of introducing a first washing solvent, preferably ethanol, into the eluent reservoir either before or after bonding the cover to the substrate.

Claim 56. (New) A method as claimed in claim 52, further comprising the step of introducing a second washing solvent, preferably isopropanol, into the eluent reservoir either before or after bonding the cover to the substrate.

Claim 57. (New) A method as claimed in claim 52, wherein the eluent, and/or the first washing solvent and/or the second washing solvent are separated from one another by a fluid.

Claim 58. (New) A method as claimed in claim 52, further comprising:

introducing eluent into the eluent reservoir after bonding the cover to the substrate;

introducing a first volume of an immiscible fluid, preferably air, into the eluent reservoir;

introducing a first washing solvent, preferably ethanol, into the eluent reservoir, whereby the first washing solvent is separated from the eluent by said first volume of immiscible fluid;

introducing a second volume of immiscible fluid, preferably air, into the eluent reservoir; and

introducing a second washing solvent, preferably isopropanol, into the eluent reservoir, whereby the second washing solvent is separated from the first washing solvent by said second volume of immiscible fluid.